REPORT
ON
A FOLLOW-UP SERVICE STUDY
OF
TRAINED GRADUATE TEACHERS

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A Research Project Sanctioned by
HE NATIONAL COUNCIL OF EDUCATIONAL RESEARCH & TRAINING
NEW DELHI

THIAGARAJAR COLLEGE OF PRECEPTORS
MADURAI-9
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PREFACE

In recent years there has been a good deal of rethinking on, and reorientation of, teacher-education. We have been striving to catch up with such progressive trends in this matter. The more significant modern features in teacher-education are practice-oriented training, periodical in-service training and fostering of research approach in solving educational problems.

In the face of the prevalent popular opinion that the teacher-training that obtains in our institutions is not only predominantly theoretical but also not quite practicable, it is necessary "to strike a balance between the academic and the professional aspects of the course." So it was felt that a study of the performances of our former trainees in the actual classroom set-up of schools could go a long way to assess the position in respect of the above notion. We, therefore, sent up our proposal for taking up the study as a research project to the National Council of Educational Research and Training and it was approved.

Our objective while carrying out the Project has been to ascertain the extent to which the methods and techniques taught in the Training College are being followed by the teachers under study. While we have tried our best to state our findings in this report in as objective and valid a manner as possible, we should make it clear that our study has been conducted, subject to the limitations mentioned in the report.

Consequently, we have avoided drawing general conclusions and restricted ourselves to making mere observations. While we are glad to report that our findings are fairly optimistic, we may state here that the same study can be widened to a much larger extent in scope for drawing comparatively comprehensive conclusions.

I express my gratitude to all my old students for their ready response and cooperation in enabling us to work out this Project and also to the Heads of Schools who have rendered assistance in this regard. I am very thankful to the Research Staff and my colleagues for their hearty and willing cooperation.

THIAGARAJAR COLLEGE OF PRECEPTORS MADURAI-9 October 30, 1964	A.NARAYANA REDDIAR PRINCIPAL & DIRECTOR OF THE PROJECT

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INTRODUCTION

* "The future of schools depends on the teacher. He is of paramount importance in a national system of education. Building and equipment are important. So are curricula, books and teaching methods. But no other aspect of education is so much significant as are the men and women who conduct the school-- the teachers. It is they who develop and make the curricula. It is they who select, employ and interpret books, maps, films, recordings and other aids to instruction. Above all, it is they who, day in and day out, year in and year out, influence by their conduct and behaviour, India's boys and girls."

"The teacher is thus the key to the whole educational process. There are, however, three serious challenges to the quality of the teaching profession. The first is the recruitment of suitable young men and women with proper academic background to the teaching profession. The second is the development of appropriate programmes of teacher education that will create masterful teachers, and the third is the shortage of qualified teachers to meet the increasing enrolment in schools."

** "The function of the Training College is to introduce the right methods of teaching in Secondary Schools through the trained teachers."

*** "There is a wide-spread belief that the methods learnt in Training Colleges are not practicable in schools nor are they meant to be so. This cuts at the root of the Training Colleges. A Training College has to justify its existence by teaching methods practicable in schools."

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*Cf. Report of the study group on the education of secondary teachers in India--Baroda 1964--Page 4.

**Cf. Report of the Secondary Education Commission 1952-53--Page 108.

***Cf. Report of the General Inspection Commission for Training Colleges--University of Madras 1963-64--Page 11.

AIM OF THE PROJECT

This College was started in 1956 and has so far sent out 750 trained graduates, most of whom are now working in various High Schools in Madras State. It was felt that it would be very worthwhile to study and evaluate the effectiveness of their professional competence in actual class-room teaching, subject to the various handicaps faced by them in their schools. With this object in view, the problems selected for investigation under the project are as follows:-

1. To analyse the content of the training as given to the student-teachers in the Training College;
2. To study the extent to which the trainees follow, in their class-room work when they serve in schools as teachers, the techniques and methods learnt during their training;
3. To study the correlation between their efficiency as teachers and their performance during the period of training;
4. To find out in what respects trained teachers are superior to untrained teachers.

GENESIS AND HISTORY OF THE PROJECT

The proposal for according sanction to this Research Project was sent from this College on 19th May 1961 to the Ministry of Education, Government of India, through the Secretary to Government, Department of Health, Education and Local Administration, Madras. The project was sanctioned on 10th July 1962 by the National Council of Educational Research and Training, New Delhi. On receipt of the necessary grant for working the project, Sri A.Venkatanarayana Iyer, B.A.,L.T., was appointed as a Research Assistant on 1st November 1962. Sri J.David Chelliah, B.A.,L.T., was appointed as the second Research Assistant on 9th October 1963. As he passed away in June 1964, Sri M.Somasundaram, B.A.,L.T., was appointed in his place on 19th June 1964. Sri D.K.Venkataraman, B.A., D.Com., was appointed as Typist-cum-Stenographer on 1st

November 1962. It was laid down by the National Council that the project should be completed within a period of two years.

TECHNIQUE

We decided to make a follow-up service study of at least 100 graduate teachers trained in this College who have put in about three years' service in the schools located in the area of our investigation, namely, the districts of Madurai, Ramanathapuram and Kanyakumari and also about twenty untrained graduate teachers. It was decided to confine the study to the three subjects, namely, English, Mathematics and General Science.

A questionnaire was prepared and sent to all the trained teachers working in the area for eliciting detailed information regarding equipment available in schools for teaching, and methods and techniques followed in class-room work in comparison with those taught in our Training College, etc.

A separate questionnaire was sent to all the Heads of High Schools under whom the concerned B.T.Assistants were working. The questionnaire called for detailed information regarding facilities, equipment, etc., available in their schools and also their academic and administrative aspects.

The Research Staff made visits to the schools,interviewed the concerned teachers and collected information in response to additional questions prepared by them. They also interviewed the Heads of Schools and sought clarification to the responses to the questions.

The lessons taught by the selected teachers under class-room conditions were observed and evaluated on the basis of an objective rating scale which was being used

in the Training College to evaluate the teacher-trainees during teaching practice. These gradings were compared with the gradings secured by them in the B.T.Practical Examination of the University. The teachers' lesson-plans, pupils' exercise books, and practical work records were also scrutinized before finally evaluating the teacher's work in the schools.

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CHAPTER 1

PROCEDURE AND TECHNIQUE ADOPTED

(a) Selection of Schools and Teachers:

As a first step the Heads of all the High Schools in the Districts of Madurai, Ramanathapuram and Kanyakumari were requested to furnish particulars in the printed form (Appendix I) supplied to them regarding trained and untrained graduate teachers working in their schools. These particulars helped to gather details regarding their service, subjects taught, etc. We are glad to report that all the Heads of Schools were kind enough to furnish the particulars called for. On receipt of these printed forms duly filled up by the Heads of Schools, a selection of about a hundred graduate teachers trained in this Collegd who had put in about three years of service in schools after taking their training and a few untrained teachers was made.

(b) Preparation of questionnaires and gathering of data:

A questionnaire (Appendix IV) was prepared and printed copies of the same were sent to all the selected teachers to gather detailed information regarding equipment available in schools, methods and techniques followed in class-room instruction, etc. A separate questionnaire was also prepared and printed copies of this questionnaire were sent to all

the Heads of Schools concerned. This questionnaire called for information regarding the administrative and academic aspects. Details regarding the agencies of the various schools selected are given in the following tabular form:-

For	Number of schools run by				Total
	Government	District Board	Municipality	Aided Agencies	
Boys	1	22	4	21	48
Girls	2	2	4	6	14
Total	3	24	8	27	62

(c) Visits to schools and supplementary questions:

To gather data regarding the day to day class-room work in High Schools, additional questions were prepared for interview (Appendix V). These questions related to the teaching of English, Mathematics and General Science and copies of these were prepared. The Research staff visited all the selected schools and held discussions with the Heads of Schools, the selected graduate teachers trained in this College and untrained graduate teachers working in them and obtained replies to the additional questions.

(d) Observation of lessons taught:

The Research staff observed the lessons taught by the teachers. Within the limited duration of the project, it was possible to observe most of the teachers only twice or thrice. During these visits they also scrutinized the lesson plans of teachers and exercise note books and practical records of pupils in General Science. The work of each teacher was evaluated on the basis of the objective rating scale adopted in the College. The following questions were framed to

evaluate the lessons in English, Mathematics and General Science:

POINTS FOR ASSESSING THE TEACHING OF ENGLISH

1. Does the teacher possess an impressive personality?
2. Are the children properly motivated to learn the new lesson?
3. Is the lesson well planned?
4. Does the teacher make the pupils understand his teaching by adopting a suitable language?
5. Does he follow the Direct Method?
6. Is there 'Situational Approach' when he teaches new words, phrases and structures?
7. Is his reading impressive as well as expressive?
8. Are his questions suitably worded to test pupils' comprehension and to make them think?
9. Are the pupils encouraged to get their doubts cleared?
10. Are the important points of the lesson elicited from the pupils?
11. Is the black-board used to the best advantage?
12. Are the pupils kept active throughout the lesson?
13. Is the response of the class satisfactory?
14. Are questions fairly distributed among the pupils?
15. Does he guide student-ideas and actions towards the lesson objective?
16. Does he conclude his lesson by recapitulating the main points?
17. Has he covered a significant portion in the period?
18. Is he humorous, resourceful and cheerful?
19. Who speaks more--the teacher or the pupils?
20. Does he maintain good discipline in the class?
21. Does he pay individual attention?
22. Does he tackle the problem-cases?
23. How far have the pupils understood the lessons taught?
24. Does he use illustrative material in the course of the lesson to make his teaching effective?
25. Are exercises for home-work given and corrected?

POINTS FOR ASSESSING THE TEACHING OF MATHEMATICS

1. Does the teacher develop the topic of the day from the topic or topics already taught in the previous classes?
2. Does he explain the principles by referring to life situations?
3. Does he make the pupils discover the relevant formulae by using models or diagrams?
4. Does he give mental sums to develop pupils' concepts and understandings with regard to the area of the topic taught?
5. Does he take speed also into account while training the pupils to answer sums?
6. Does he make the best use of the black-board?
7. Does he develop the computational skill of the pupils?
8. Are the problems given by him realistic?
9. Does he make the pupils analyse a problem?
10. Are the pupils made to state what is required to be found out in a problem?
11. Does the teacher make the whole class participate in discussing the method of working a problem?
12. Is the class kept active throughout?
13. Does he train the pupils to write the steps of working a problem neatly and legibly in their note-books?
14. Does he train the pupils to frame problems?
15. Is he enthusiastic?
16. Does he develop logical thinking and reasoning in the pupils?
17. Does he create and sustain in the pupils an interest for learning Mathematics?
18. Are audio-visual aids made use of to keep up the zeal of the pupils?
19. Does he correlate the different branches of Mathematics, viz., Arithmetic, Algebra, Geometry and Graph?
20. Does he bestow special attention to backward pupils to enable them to catch up with other students?
21. Does he encourage bright pupils to greater efforts?
22. Is good discipline maintained?
23. Does he give adequate home-work for practice and for applying principles taught?

24. Does he make use of suitable aids to make his instruction effective?

25. Does he take proper remedial measures to rectify defects?

POINTS FOR ASSESSING THE TEACHING OF GENERAL SCIENCE

1. Was the unit of instruction a significant problem related to the pupils' apperception mass as well as their interests?

2. Did the attitude of the pupils towards the lesson indicate that it was stimulating and inspiring?

3. Were facts and ideas significantly organized with reference to the problem?

4. Was the lesson problem clearly and logically related to what had preceded it and what was to follow it in the course?

5. Did the lesson problem and the teacher's methods encourage pupils' initiative and self-activity? In other words, did the pupils adopt the problem as their own and think on the subject all the time?

6. Was a definite unit or problem completed during the lesson period, if the main lesson problem was too long to be solved in a single period?

7. When the lesson was finished, was it evident that the essential points of the problem and the method of its solution stood out clearly and that they had been thoroughly comprehended by the pupils?

8. Did the teacher plan the lesson well in advance and adhere to it as far as possible?

9. Was the teacher clear and logical in thought and speech?

10. Did the teacher show proficiency in the subject and genuine enthusiasm for it?

11. Did the teacher make use of concrete illustrative material, demonstrations, and experiments in sufficient quantity and with sufficient skill to make the principles and relationships clear?

12. Did the teacher attempt to use improvised apparatus or aids to make his teaching efficient, in case the school had no such scientific equipments?

13. Did the teacher and the pupils use clear, concise and correct language?

14. Did the teacher enlist adequate pupil-participation during the demonstration of experiments?

15. Did the pupils raise questions and doubts, demand and supply evidence, and exercise their powers of reasoning and judgment?

16. Were hypotheses advanced by pupils? Were the hypotheses systematically tested and selected?

17. Were the pupils made to associate the facts and principles considered in the lesson with appropriate life situations?

18. Did the teacher make the pupils apply the ideas brought out in the lesson in such a way as to develop an intelligent, practical command of them?

19. Did the teacher adopt the inductive approach whenever feasible?

20. Did the teacher employ the heuristic approach to the extent possible?

21. Did the teacher contribute substantially to the development of scientific attitudes and habits?

22. Was the assignment of the lesson so planned with care and forethought that the pupils understood definitely and clearly what was expected of them?

23. Did it provide for no more work than the average pupil might reasonably be expected to do, in view of all the other school tasks assigned to him?

24. Did the teacher ensure that each pupil had accomplished the work assigned to him?

25. To what extent were the needs of the slower pupils and the exceptionally bright ones given special attention?

The above 25 points in each of the three subjects were considered for evaluation. Each point was given a score of 4, 3, 2, (1 or 0) according as it was evaluated to be very good, good, average or below average. The final grading was determined as follows:

Very good ... 60% and above

Good ... 50% to 59%

Average ... 40% to 49%

Below average ... Below 40%

(Continued)

The following table gives details regarding the number of lessons observed and evaluated in the three subjects:

Subjects	Types of teachers	Lessons				
		No. observed	Very Good	Good	Average	Below average
English	Trained	85	1	42	42	-
	Untrained	3	-	-	-	3
Mathematics	Trained	65	1	33	31	-
	Untrained	12	-	1	-	11
Gen.Science	Trained	31	1	18	12	-
	Untrained	7	-	-	-	7

In cases where two or more lessons were observed in the same subject given by the same teacher, the average value was taken for final grading.

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CHAPTER II

ANALYSIS OF DATA COLLECTED

Recruitment of Trainees:

The following table gives details regarding the number of applications received and the number admitted during the eight years of its working:

(Continued)

Year of Training	Number of Applications					
	Received			Admitted		
	Men	Women	Total	Men	Women	Total
1956-57	136	-	136	60	-	60
1957-58	177	48	225	75	25	100
1958-59	196	62	258	70	30	100
1959-60	158	73	231	65	35	100
1960-61	130	108	238	61	39	100
1961-62	188	79	267	60	40	100
1962-63	188	88	276	60	40	100
1963-64	157	77	234	60	40	100

The ratio of number of applications received to number admitted works out to 5:2 on an average.

The following table gives details regarding the annual income groups of the trainees who have been trained in this College.

Year of Training	Income Groups				No. discontinued
	Rs.6000 & Above	Rs.2501-Rs.6000	Rs.751-Rs.2500	Rs.750- & Below	
1956-57	-	3	32	23	2
1957-58	-	8	46	45	1
1958-59	1	16	57	24	2
1959-60	-	20	58	22	-
1960-61	1	9	56	33	1
1961-62	2	13	44	38	3
1962-63	-	11	60	28	1
1963-64	1	16	46	37	-
TOTAL	5	96	399	250	10

This goes to show that 87% of the trainees are from the income group Rs.2500/- and below.

The academic qualifications of the entrants of this Training College for the last 5 years are as follows:

Year of Training	Academic Qualifications											
	B.A.			B.Sc.			B.A.(Hons.) and M.A.			M.Sc.		
	I Cl.	II Cl.	III Cl.	I Cl.	II Cl.	III Cl.	I Cl.	II Cl.	III Cl.	I Cl.	II Cl.	III Cl.
1959-60	2	4	75	-	5	13	-	-	1	-	-	-
1960-61	1	7	64	3	8	15	-	-	2	-	-	-
1961-62	4	-	37	3	-	53	-	-	3	-	-	-
1962-63	1	-	21	3	14	57	-	2	1	-	1	-
1963-64	-	-	19	5	16	55	1	3	-	-	1	-

From the above table it is clear that 83% of trainees are only Third class graduates.

The following table gives details regarding the previous experience of trainees:

Year of Training	Above 5 years	Between 2 & 5 yrs.	Between 1 & 2 yrs	Below 1 yr.	No teaching experience
1956-57	1	11	7	13	28
1957-58	5	22	16	20	37
1958-59	6	14	11	8	61
1959-60	-	-	2	4	94
1960-61	-	1	3	6	90
1961-62	-	7	13	22	58
1962-63	2	5	13	22	58
1963-64	2	2	11	41	44

It is evident from the above that nearly 63% of the trainees have no previous teaching experience.

Scholarships and fee concessions or stipends awarded to the trainees of in the following table:

S.No. Nature of Aid	1956-57		1957-58		1958-59		1959-60		1960-61	
	No. of students	Amt. Rs	No. of students	Amt. Rs	No. of students	Amt.	No. of students	Amt Rs	No. of students	Amt Rs
1. Scholarship to Backward and Scheduled caste students awarded by the Department of Harijan Welfare, Madras.	1	260	5	1,895	-	-	-	-	4	2,155
2. Awarded by the Government of India through State Govt. for Residential Students	3	1,269	-	-	-	-	1	382	1	588
3. Stipend by the Director of Public Instruction, Madras	18	2,880	32	7,553	27	5,090	9	1,262	30	5,438
4. Stipend by D.P.I., Madras, for B.A. (Hons.) students only	-	-	-	-	-	-	-	-	-	-
5. District Board Stipend	5	2,150	16	7,249	8	2,070	2	1,000	-	-

Only 30% of the trainees are benefited by the award of scholarships, fee

Teachers under study:

The age groups of the 121 teachers under study are as follows:

S.No.	Age in years	No. of Teachers
1	40 years and above ...	1
2	Between 35 years and 39 years...	1
3	Between 30 years and 34 years...	22
4	Between 25 years and 29 years...	91
5	Below 25 years ...	6

The salary groups of the above teachers are as follows:

S.No.	Basic Salary group	No. of Teachers
1	Rs.200 and above ...	Nil
2	Between Rs.150 and Rs.199 ...	95
3	Below Rs.150 ...	26

The experience of the teachers is given in the following table:

S.No.	Years of Experience	No. of teachers
1	5 years and above ...	49
2	4 years ...	22
3	3 years ...	50

The above tables go to show that (i) all the teachers but 2 are below 35 (ii)they are all drawing salaries ranging from Rs.150/- to Rs.200/- and (iii) 72 of them have less than 5 years of experience.

CHAPTER III

FINDINGS

THE TEACHING OF ENGLISH

From the replies received from 85 teachers of English in the upper standards in 53 High Schools and from the observation of their classroom work, the following analysis is made:

1. 62 teachers give practice in oral reading and train the pupils to read with correct pronunciation and proper intonation.

2. Only 32 teachers encourage pupils to look up the dictionary.

3. Books are issued from libraries by 52 teachers and they maintain library stock registers and issue registers.

4. The Direct Method is followed by 76 teachers.

5. Efforts are taken by 80 teachers to provide drill in the use of structures taught.

6. 32 teachers encourage silent reading by giving the necessary historical and geographical background. Non-detailed text-books are taught by others as detailed text-books.

7. No teacher has conducted speed and comprehension tests in reading.

8. Group Method is followed by 10 teachers in respect of composition work.

9. 4 teachers give practice in chorus recitation of English poems.

10. Functional Grammar is taught by all.

11. Written achievement tests are conducted by all.

12. Oral questioning is adopted by 60 teachers.

13. Only 12 teachers meet once a month to discuss the effect of teaching and pupil-achievement after tests.

14. No class room experiment in teaching has been tried.

15. Model lessons by senior teachers are arranged in 3 schools under the auspices of Teachers' Associations.

16. Written composition is given by all the teachers every week. Translation exercises from English to mother-tongue and vice versa are given as part of composition work.

Mistakes in spelling and grammar in composition work are corrected and pupils are required to rewrite as corrected.

SUMMARY

Number of teachers observed ... 85
Number of schools visited ... 53

No.	Methods and Procedures	No. of Teachers
1	Direct Method ...	76
2	Drill in the use of structures ...	80
3	Encouraging silent reading of non-detailed texts ...	32
4	Group Method in Composition ...	10
5	Group Method in English Poetry ...	4
6	Teaching of Functional Grammar ...	85
7	Practice in oral reading ...	62
8	Fostering Dictionary habit ...	32
9	Library Reading ...	52
10	Speed and Comprehension Tests ...	Nil
11	Oral questioning ...	60
12	Written Composition ...	85
13	Classroom experiment in teaching ...	Nil

No.	Activities.	No.of Schools
1	Model Lessons ...	3
2	Periodical Meetings of Teachers	12

OBSERVATIONS

The following are the satisfactory features:

1. The Direct Method is largely adopted by teachers.
2. Drill in the use of structures is also adequately given.
3. Functional Grammar is invariably taught.
4. Written Composition is given due importance.
5. Oral reading and oral questioning are fairly well done.

There is much room for improvement with regard to the following:

1. Fostering of dictionary habit.
2. Practice in silent reading.
3. Demonstration lessons by senior teachers.
4. Consultative meetings of teachers.
5. Group Method in Composition work and teaching of Poetry.
6. Classroom experiments in teaching.

THE TEACHING OF MATHEMATICS

Replies were received from 65 teachers handling Mathematics in response to the questionnaires. From the scrutiny of these replies and the observation of their classroom work, the following analysis is made:

1. Written Diagnostic Tests are conducted by 30 teachers for different topics, to locate areas of difficulty and remedial measures taken.

2. 57 teachers give new type questions to test pupils' grasp of fundamental principles.

3. 5 teachers test pupils' speed in answering.

4. Filmstrips are used by 12 teachers to create interest in the learning of Mathematics.

5. Mental sums are given by all at the beginning of every topic and also during revision.

6. Home work is given daily by all the teachers to supplement class work. About 2 to 5 sums are given according to the nature of the topic dealt with.

7. All the teachers hold weekly tests of 45 minutes' duration. Monthly tests of longer duration are also given. Points of difficulty are re-taught after the valuation of the test papers.

8. 4 schools have Mathematics Clubs. Teaching aids are made as a club activity and life histories of great Mathematicians are presented at club meetings.

9. In a dozen schools teachers meet monthly and discuss problems.

10. Model lessons are given by senior teachers in 2 High Schools only.

11. 19 teachers put into practice the Analytico-synthetic method for teaching Theoretical Geometry.

12. The Heuristic Approach is encouraged by 42 teachers.

13. The Laboratory Method is adopted by only one teacher.

14. The Project Method is not followed.

SUMMARY

Number of teachers observed ... 65
Number of schools visited ... 53

No.	Methods and Procedures	No. of Teachers
1	Analytico-synthetic Method ...	19
2	Heuristic Method ...	42
3	Laboratory Method ...	1
4	Project Method ...	Nil
5	Diagnostic Tests ...	30
6	New Type Tests ...	57
7	Speed Tests ...	5
8	Use of Filmstrips as aids ...	12
9	Mental Sums ...	65
10	Home work ...	65
11	Written Tests ...	65

No.	Activities	No. of Schools
1	Mathematics Clubs ...	4
2	Periodical Meetings of Teachers ...	12
3	Model Lessons ...	2

OBSERVATIONS

The following are the satisfactory features:

1. Mental sums, homework and written tests are given the fullest importance.

2. Short questions are given by a large majority of teachers.

3. The Heuristic Approach is fostered by two thirds of the teachers.

There is much room for improvement with regard to the following:

1. The use of the Laboratory Method.
2. Speed and Accuracy Tests.
3. Making and using of simple improvised slides and filmstrips.

THE TEACHING OF GENERAL SCIENCE

1. 31 teachers handling Science in the upper standards of 28 schools were interviewed and their lessons observed and evaluated. The following table gives details regarding laboratory equipment available in those High Schools:

S.No	Kind of Laboratory Equipment	No. of Schools
1	No Laboratory ...	2
2	Inadequate Laboratory ...	7
3	Adequate Laboratory ...	19

2. The Demonstration Method is followed by 11 teachers in schools having adequate laboratory facilities. 2 Science teachers adopt the chalk and talk method though there is adequate equipment available in their schools.

3. No school has a separate Science Library.

4. No school has a separate Science Bulletin Board.

5. 10 schools have Science Clubs.

6. Excursions are conducted by 17 teachers to places of Scientific interest.

7. Laboratory Method is adopted by 15 teachers in schools having adequate equipment. In schools where there are a large number of sections, practical work is conducted in batches, two or more pupils working with one set of apparatus. In these 15 schools about 10 experiments are performed in a year

by pupils of X and XI Standards. Records of experiments are maintained by the pupils and scrutinized. Individual practical work by pupils is not done in any school.

8. 10 schools have built up museums and 2, aquariums. In 4 schools garden activity is carried on.

9. Film shows are conducted in 19 schools.

10. Printed charts, slides and filmstrips are used as teaching aids in schools that have them. Details regarding their availability are given in the following table:

S.No.	Aids used		No.of Schools
1	Printed Charts	...	21
2	Hand-drawn Charts	...	11
3	Slides	...	15
4	Filmstrips	...	17
5	Films	...	12

Casual listening to educational broadcasts of A.I.R.is arranged in 24 schools.

The following table gives details regarding the availability of audio-visual aids:

S.No.	Kind of Audio-Visual Aids		No.of schools
1	Sound Projector	...	19
2	Tape Recorder	...	15
3	Filmstrip Projector	...	24
4	Radio	...	25
5	Camera	...	24

12 Schools have all the above aids. 3 schools do not have any of the above audio-visual aids.

11. No school has a Hobby Club.

12. Educational exhibitions are conducted in 10 schools. All the teachers in the city and the neighbouring schools participated in the two Science Fairs organized by the Extension Services Department of the Thiagarajar College of Preceptors during the period of study.

13. No teacher adopts the Heuristic Method for teaching Science.

14. The Project Method is not adopted.

SUMMARY

Number of teachers observed	...	31
Number of schools visited	...	28

No.	Method	No. of Teachers
1	Demonstration Method ...	11
2	Laboratory Method	
	(a) Group Method ...	15
	(b) Individual Method ...	Nil
3	Project Method ...	Nil
4	Heuristic Method ...	Nil

No.	Activities	No. of Schools
1	Science Club ...	10
2	Excursion ...	17
3	Museum ...	10
4	Aquarium ...	2
5	Garden Work ...	4
6	Film Shows ...	19
7	Listening to Educational Broadcasts	24
8	Hobby Club ...	Nil
9	Exhibitions ...	10

OBSERVATIONS

The following are the satisfactory features:

1. Practical work in groups is given due importance by half the number of teachers.
2. The Demonstration Method is adopted by a third of the teachers.
3. Casual listening to educational broadcasts is arranged in a large number of schools.

There is much room for improvement with regard to the following:

1. Individual practical work by pupils.
2. Laboratory equipment and Audio-visual aids.
3. Science and Hobby Clubs.
4. Museums and Aquariums.
5. Garden work.
6. Project Method.
7. Making improvised aids with indigenous materials.
8. Excursions to places of scientific interest.

N.B.: With regard to filmshows and educational broadcasts greater planning and attention are absolutely necessary. Films and topics of broadcasts should be carefully chosen to supplement class work.

2. With regard to the Project Method, projects of simple nature may be selected and worked out, enlisting pupils' participation in all the stages.

3. Heuristic Approach may be adopted to the maximum extent possible while teaching laws and principles.

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CHAPTER IV

EVALUATION

The teaching performances of the 121 teachers under study were evaluated. The following table presents a comparative study of the classes secured by them in the B.T. Degree (Practical) Examination of the University of Madras and their teaching efficiency as evaluated during the study:

S.No.	Name	Class in B.T.	Efficiency evaluated
1	Sri V.M.Durairaj, B.A.,B.T.	II	Good
2	Sri M.Muhammad Abdul, B.Sc.,B.T.	II	Good
3	Mrs. V.Saroja, B.A.,B.T.	II	Good
4	Miss S.Gnanambal, B.Sc.,B.T.	I	Very Good
5	Sri R.Kamatchi, B.A.,B.T.	III	Average
6	Sri S.Ganesan, B.A.,B.T.	III	Average
7	Sri R.S.Mani, B.A.,B.T.	II	Average
8	Sri S. Ramakrishnan, B.Sc.,B.T.	III	Good
9	Sri M.Chinnaswami, B.A.,B.T.	II	Good
10	Sri T.Venugopalan, B.A.,B.Sc.,B.T.	III	Good
11	Sri V.Sathuragiri Mahalingam, B.Sc.,B.T.	III	Average
12	Sri R.Ramasubbu, B.A.,B.T.	III	Average
13	Sri N.Maruthamuthu, B.A.,B.T.	III	Average
14	Sri N.Krishnamurthi, B.Sc.,B.T.	III	Average
15	Sri K.Duraisamy, B.A.,B.T.	II	Average
16	Sri S.Swaminathan, B.A.B.T.	III	Good
17	Sri S.Md. Abdul Kader, B.A.,B.T.	III	Average
18	Sri G.Srinivasan, B.A.,B.T.	II	Average
19	Sri P.L.Kulandaisamy, B.A.,B.T.	II	Good
20	Sri V.Mahadevan, B.Sc.,B.T.	II	Average
21	Sri K.Nagarajan, B.A.,B.T.	III	Average
22	Sri A.S.Kandasamy, B.A.(Hons.), B.T.	III	Average

S.No.	Name	Class in B.T.	Efficiency evaluated
23	Sri P.R. Vasudevan, B.A.,B.T.	III	Average
24	Miss L.Kamalam, B.A.,B.T.	II	Good
25	Sri R.Dhanasekaran, B.A.,B.T.	III	Good
26	Sri R.Varadachari, B.A.,B.T.	II	Average
27	Sri T.Babu Rajendra Prasad,B.Sc., B.T.	I	Good
28	Sri R.Keppanan, B.Sc.,B.T.	II	Good
29	Miss P.Vidyavathi, B.Sc.,B.T.	II	Good
30	Miss Gomathi Pasungili, B.A.,B.T.	II	Good
31	Miss R.Andal, B.A.,B.T.	II	Good
32	Sri B.Richard Reginald Rajendran, B.A.,B.Sc.,B.T.	III	Average
33	Sri D.Paul Rajendran, B.A.,B.T.	II	Good
34	Sri H.David Wilson Gnanadurai, B.A.,B.T.	III	Average
35	Sri M.N.R.Lakshmanan, B.Sc.,B.T.	II	Good
36	Sri T.V.Krishnamurthi, B.Sc.,B.T.	I	Good
37	Sri K.G.Chandrakasan, B.A.,B.T.	I	Good
38	Sri Joseph Stanislaus, B.A.,B.T.	II	Good
39	Sri S.Chellappan, B.A.,B.T.	III	Average
40	Miss R.Indira, B.A.,B.T.	II	Good
41	Sri R.Krishnamurthi, B.Sc.,B.T.	III	Average
42	Sri N.Paramasivam, B.A.,B.T.	III	Average
43	Sri C.Periasamy, B.A.,B.T.	III	Average
44	Sri N.Ganapathy, B.A.,B.T.	III	Good
45	Sri E.Balasubramanian, B.A.,B.T.	II	Good
46	Sri J.J.Sabapathy, B.A.,B.T.	II	Average
47	Sri C.Jayaraman, B.A.,B.T.	II	Average
48	Sri V.Narasimmaraman, B.A.,B.T.	III	Average
49	Sri M.Ambalam, B.A.,B.T.	III	Average
50	Mrs. S.Vasantha, B.A.,B.T.	III	Average

S.No.	Name	Class in B.T.	Efficiency evaluated
51	Miss R. Sarasvathi, B.Sc.,B.T.	II	Average
52	Sri N.Narayanasami, B.A.,B.T.	III	Average
53	Miss N.Regina Nallathambi,B.Sc.,B.T.	I	Good
54	Sri A.David Dayanithi, B.A.,B.T.	II	Good
55	Sri Samuel Chinniah, B.A.,B.T.	III	Good
56	Sri T.G.Rajan, B.A.,B.T.	II	Average
57	Sri N.N.Devadoss, B.A.,B.T.	I	Good
58	Miss Janet Kamalabai, B.A.,B.T.	I	Average
59	Sri T.Viswanathan, B.A.,B.Sc.,B.T.	I	Very Good
60	Miss N.Kokila Kalyani, B.A.,B.T.	I	Good
61	Sri N.Ramaswamy Iyer, B.A.,B.T.	III	Average
62	Mrs. Krishnaveni Rajaram, B.A.,B.T.	III	Good
63	Miss L.N.S.Sarojini, B.Sc.,B.T.	II	Good
64	Mrs. T.V.Lakshmikantham, B.Sc.,B.T.	III	Very Good
65	Sister Mary Joscfa, B.Sc.,B.T.	II	Good
66	Miss G.Rajam, B.Sc.,B.T.	I	Good
67	Miss A.Mythili, B.Sc.,B.T.	II	Good
68	Sri Syed Gulam Mustafa, B.A.,B.T.	III	Good
69	Sri N.Samuel Jayapandian, B.Sc.,B.T.	III	Good
70	Sri R.Jayaraman, B.A.,B.T.	II	Average
71	Sri S.Selvaraj, B.Sc.,B.T.	II	Good
72	Miss M.B.Lakshmi, B.A.,B.T.	II	Good
73	Miss Ida Catherine Prema, B.Sc.,B.T.	I	Good
74	Miss C.Viruthambal, B.Sc.,B.T.	II	Good
75	Mrs. T.R.Vimala, B.A.,B.T.	III	Average
76	Mrs. Parvathiaswami, B.Sc. B.T.	II	Average
77	Sri Albert Samuel Jeya Singh,B.A.,B.T.	III	Average
78	Sri K.G.Krishnan, B.A.,B.T.	III	Average
79	Sri M.Kaleeswaran, B.A.,B.T.	III	Below Average
80	Sri R.Ramanathan, B.A.,B.T.	III	Average

S.No.	Name	Class in B.T.	Efficiency Evaluated
81	Sri P.Govindan, B.A.,B.T.	III	Average
82	Miss Seethalakshmi, B.Sc.,B.T.	I	Good
83	Miss V.S.Parimala, B.A.,B.T.	II	Good
84	Miss S.Rengamani, B.A.,B.T.	II	Good
85	Miss S.Gomathy, B.Sc.,B.T.	II	Below Average
86	Sri K.Chandrasekaran, B.A.,B.T.	III	Good
87	Sri R.M.Krishnan, B.Sc.,B.T.	III	Good
88	Miss N.Savitri, B.A.,B.T.	III	Good
89	Sri R.Natarajan, B.A.,B.Sc.,B.T.	III	Below Average
90	Sri V.Thangapandian, B.A.,B.T.	III	Average
91	Sri S.A.Narayanan, B.A.,B.T.	III	Average
92	Sri T.Sankaralingam, B.A.,B.T.	II	Average
93	Sri V.Vedagiri, B.A.,B.T.	III	Good
94	Sri A.Kuttalingam, B.A.,B.T.	III	Good
95	Sri C.Sundararajan, B.A.,B.T.	III	Good
96	Sri M.Dharmar, B.Sc.,B.T.	III	Average
97	Sri A.Sankaravallinayagam,M.A.,B.T.	III	Good
98	Sri P.Ramachandran, B.A.,B.T.	III	Good
99	Sri M.Ponnusamy, B.A.,B.T.	II	Average
100	Mrs. P.Krishnammal, B.A.,B.T.	I	Very Good
101	Sri V.Dharmar, B.A.,B.T.	II	Average
102	Sri S.P.Paramanantham, B.A.,B.T.	II	Good
103	Sri K.S.Irudaya Pitchai, B.A.,B.T.	III	Good
104	Sri R.Raju, B.A.,B.T.	II	Average
105	Sri W.S.R.Hariharan, B.A.,B.T.	II	Good
106	Sri P.Sandanachami, B.A.,B.T.	III	Average
107	Sri A.Arumugaperumal, B.A.,B.T.	II	Average
108	Sri A.Ayyappan, B.Sc.,B.T.	III	Average
109	Sri K.Shanmugakani, B.A.,B.T.	III	Average
110	Sri S.V.Thiagarajan, B.A.,B.T.	III	Good

S.No.	Name	Class in B.T.	Efficiency evaluated
111	Sri M.Joseph, B.Sc.,B.T.	III	Average
112	Sri A.Balakrishnan, B.A.,B.T.	III	Good
113	Mrs. Helen Jesudasan,B.A.,B.T.	III	Average
114	Sri S.Seshadri, B.A.,B.T.	III	Good
115	Miss D.Sugirthavalli Jothi Bai, B.A.,B.T.	III	Good
116	Sri B.K.Mani, B.Sc.,B.T.	II	Good
117	Sri C.Rathinam, B.A.,B.T.	III	Good
118	Sri N.Narayanasubbian, B.Sc.,B.T.	II	Good
119	Sri P.Lakshmanan, B.Sc.,B.T.	III	Average
120	Sri A.S.Balakrishnan, B.A.,B.T.	III	Average
121	Sri Y.Reginald Davis, B.Sc.,B.T.	I	Good

The following table is a conspectus of the above statement:

Class in B.T. Practical Examination	No. of Teachers	Evaluation by Research Staff			
		Very Good	Good	Average	Below Average
I	14	3	9	2	-
II	45	-	28	16	1
III	62	1	23	36	2

In cases where the same teachers have given more than one lesson, the average of their performances has been taken for final evaluation.

Out of 14 teachers securing I Class in the B.T.Practical Examination, 3 have been evaluated as very good and 9 have been evaluated as good.

Out of 45 teachers securing II Class in the B.T.Practica Examination, 28 have been evaluated as good.

Out of 62 teachers securing III Class in the B.T.Practical Examination, 36 teachers have been evaluated as average.

On the whole, the gradings of the performances of 76 teachers during the study tally with the classes secured by them in the B.T.Practical Examination. This works out to 63 per cent of the teachers under study. Of the 24 teachers who have secured III Class in the B.T.Practical Examination, one gave a very good performance and 23 good performances.

N.B.: The teachers under study did not receive their training in one and the same year. They underwent training during the years 1956-61. The criteria for evaluation adopted by the University which remained the same during the period (Vide Appendix VI) has formed the basis for our evaluation also.

Of the 22 untrained teachers (Vide Appendix III) whose lessons were observed and evaluated on the same rating scale as applied to Trained Teachers, the performance of only one teacher has been found to be good. The performances of the remaining 21 teachers have been assessed to be below average.

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CHAPTER V

SUGGESTIONS

1. Content of Training Course:

The study has revealed the urgent need for revising the content of the training course so as to make it more practice-oriented. The Committee on Plan Projects has also

(Continued)

observed:

* "Training courses are too theoretical and are not always helpful to the teacher in the classroom. Practical training in the Training College should prepare teachers to face life situations properly when they start work as teachers."

This has also been supported by the General Inspection Commission for Training Colleges, University of Madras, 1963-64, Page 13. It observes:

"The course has to be more practice-oriented. Much of the theory taught to-day can be discarded without prejudice to the effectiveness and professional nature of the course. The practical skills like teaching, testing, guidance, etc. should be given more emphasis."

Hence the following suggestions:

1. Demonstration lessons applying different methods may be evenly spread over the course.

2. Each trainee may be required to give at least one lesson using each of the practicable methods.

3. The duration of the Intensive Teaching Practice may be extended to 12 weeks as suggested by various committees

2. Methods and Techniques:

In regard to the above, it is gratifying to note that almost all the methods taught in the Training Course are being practised by a large number of teachers. As far as it is observed the question of applying a particular method

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* Draft report on teacher training 1964 by the Committee on Plan Projects--unpublished--Page 26.

depends to a large extent upon the abilities and interests of the teachers concerned, though there may be other factors like the availability of equipment, facilities, etc. and the encouragement and guidance given by the head-teacher.

In order to help teachers, the question of attaching subject specialists to the Inspectorate may be considered.

Liberal grants to equip libraries, laboratories, etc. adequately may be provided in order to enable teachers to adopt dynamic methods of teaching to the extent possible.

3. Examination System:

Teachers often complain that they are not able to adopt the methods and techniques learnt in Training Colleges in their classroom teaching because the programme of Secondary Education is too much dominated by external examination. Most teachers have very much to coach and very little to teach. Dictation of notes and answers to expected questions consumes most of the time. Internal assessment of pupils' work should be given due weightage for final assessment.

4. In-service Training:

The training that a graduate receives in a Training College is but the beginning of the process of education. He should see that he does not fall into the rut and stagnate. He should try to put into practice the latest pedagogical methods and techniques. A Training College can never hope to produce finished products. Increased efficiency will come only through experience and through individual and group efforts at improvement.

Pedagogy is advancing so rapidly that even the best teacher is likely to be out-of-date within a short period.

Unless he is up-to-date, he will not appreciate any new development in education. This is the reason why in-service training is recommended.

In-service education programme for teachers should be a regular feature of every Training College. It should be obligatory on the part of all teachers to go through refresher courses at least once in three years. They should be encouraged to attend the in-service training at regular intervals. Incentives such as travelling and other allowances and increments in salary should be provided for teachers who take part in in-service programmes.

5. Better graduates for teaching:

* "The poor academic background of the students in the Training Colleges should be an eye-opener to those concerned with education. With the overwhelming majority of them being no better than third class graduates, the annual wastage in terms of failure is over 40% in the State and 35% throughout India. Wastage apart, the ability of such low quality graduates to do justice to a profession of such social significance is to be doubted. Immediate steps are, therefore, to be contemplated for attracting better recruits to the teaching profession. Though it is connected with the status and pay scales of teachers, something should be done at Training College level to attract better people to the profession....... . Liberal stipends and scholarships should be awarded to well-qualified entrants."

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* Report of the General Inspection Commission for Training Colleges--University of Madras--1963-64--Pages 11 and 12.

** "The Commission feels that there is justification for the popular belief that teaching remains the last resort to the persons who knocked at the doors of other professions and got no entrance. Better incentives to attract superior talent to the profession as well as a stricter method of selection by which those unfit for the profession be weeded out at the training level . are needed to safeguard the status of the profession and to improve the quality of practice in the profession."

It has been pointed out in the analysis of the salaries drawn by the teachers under study that all the 121 teachers are drawing basic salaries between Rs.150/- and Rs.199/- only, even after five years of experience. It is, therefore, suggested that trained graduates should be started on a decent and attractive salary in keeping with their qualifications and responsibilities.

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** Report of the General Inspection Commission for Training Colleges--University of Madras--1963-64--Page 24.

APPENDIX - I

LIST OF GRADUATE ASSISTANTS, TRAINED AND UNTRAINED

Name of school: Place: Name of Headmaster or Headmistress.

Total strength from standard VIII to X.

1. S.No.

2. Name of Graduate Assistants

3. Age.

4. General qualifications:

    (a) Degrees taken;

    (b) Subjects - Main and subsidiary.

    (c) Year of passing.

    (d) Class taken.

5. Professional qualifications:

    (a) Degrees taken;

    (b) Optional subjects:

    (c) Year of passing:

    (d) Class taken

        Theory
        Practice

    (e) College in which trained:

6. Classes and subjects handled:

7. No. of years of service:

8. Remarks.

Place:
Date:

Signature of Headmaster
or Headmistress.

APPENDIX II - LIST OF SCHOOLS SELECTED.

Madurai District - Rural Schools:

D.K. Board High School, Natham.
Board High School, Melur.
Board High School for Girls, Tirumangalam.
V.M. Board High School, Periyakulam.
Government Girls' High School, Periyakulam.
Saraswathi Nadar High School, Theni.
V.M. High School, Bodinaickenur.
Nadar Board High School, Nilakottai.
Board High School, Alanganallur.
K.R.H. Board High School, Uthamapalayam.
Board High School, Kalligudi Chatram.
V.V. High School, Venkatachalapuram.
Government High School, Checkanurani.
Board High School, Sholavandan.
Board High School for girls, Sholavandan.
Devangar High School, Chinnalapatti.
Jeyaraj Nadar High School, Nagamalai Puducottai.
Board High School, Usilampatti.
Board High School, Andipatti.
Pasumalai High School, Pasumalai.
Thiagarajar High School, Vasanthanagar.
Municipal High School, Palni.
Government Girls' High School, Palni.
Municipal High School, Dindigul.
Board High School, Peraiyur.
M.M. High School, Tirunagar.
Sithalakshmi Girls' High School, Tirunagar.

Madurai District - Schools in Madurai Town.

Capron Hall Girls' High School.
U.C. High School.
Thiagarajar Model High School.

Sourashtra Girls' High School.

Nirmala Girls' High School.

Municipal High School, Shenoynagar.

Municipal High School for Girls, Ramnad Road.

Municipal High School for Girls, East Avani.

Nadar High School, South Gate.

Madura College High School.

Sethupathi High School.

Municipal High School, South Gate.

Municipal High School for Girls, Athimoolam Pillai Agraharam.

Ramanathapuram District - Schools.

Rajah's High School, Sivaganga.

St. Mary's High School for Girls, Devakottai.

Board High School, Rameswaram.

Board High School, Mallanginar.

Board High School, Pandalgudi.

S.S. Board High School, Rajapalayam.

Board High School, Kalayarkoil.

Board High School, Sundarapandiam.

Board High School, Sankaralingapuram.

Board High School, Nenmeni Mettupatti.

Hindu Nadar Victoria High School, Sivakasi.

T.P. N.M. Nadar High School, Thalavoipuram.

Board High School, Ramachandrapuram.

T.P.N. Municipal Girls' High School, Virudhunagar.

A.V. High School, Sattur.

S.H.N. Ethel Harvey Girls' High School, Sattur.

Visalakshi Kalasala High School, A. Thekkur.

Devangar High School, Aruppukottai.

N.M. Board High School, Tiruppattur.

A.C.A.V. High School, Paramakudi.

Kanyakumari District - School.

Scott Christian High School, Nagercoil.

APPENDIX III

LIST OF UNTRAINED GRADUATES INTERVIEWED AND OBSERVED.

Sri S. Packiam, B.Sc.

Miss C. Thangamani, B.Sc.

,, I. Gujalambala, B.A.

,, R. Vimala, B.A.

,, N. Krishnaveni, B.Sc.

Sri P. Chellapalam, B.Sc.

,, Madhavan, B.Sc.

,, S. Muniyandi, B.Sc.

,, R. Saravanabhavan, B.Sc.

,, B.S. Ganapathy, B.A.

,, V. Karmegam, B.Sc.

Miss N. Mahalakshmi, B.Sc.

,, N. Elizabeth, B.Sc.

,, V. Boovana, B.Sc.

,, Vimala Jeyaseeli, B.Sc.

Sri N. Srinivasan, B.Sc.

,, S. Muthukrishnan, B.Sc.

,, Charles David, B.A.

,, T. Arumugam, B.Sc.

,, A. Rajappa Srinivasan, B.Sc.

,, Lakshminarayanan, B.Sc.

,, N. Gurusamy, B.A.

APPENDIX IV

QUESTIONNAIRE

(FOR TRAINED GRADUATE ASSISTANTS)

I. EQUIPMENT

1.(a) Give a list of equipment (Reference books, books on Teaching Methods, Apparatuses, etc.) available in your School.

(b) Which of these are frequently used by you?

2. Mention other essential equipments and books you consider to be necessary additions for the effective teaching of your subject.

II. METHODS

3. State the methods that you generally adopt for the teaching of your subjects. Give details.

4. Of the different methods studied by you in the Training College, name the methods you find useful.

5. If you have conducted classroom experiment with any specific method, give details and your inferences.

6. Mention the obstacles, if any, in adopting new methods and experiments. Have you any suggestions to overcome them?

7. Do you dictate summaries, questions and answers etc?

8. Mention the different kinds of oral and written work given to your pupils in the class.

9. What types of practical work do you give in your subjects?

10. How often do you give home-work to your pupils? What are the different kinds of home-work given by you? What procedure is adopted by you with regard to the correction of home-work?

11. (a) What special Teaching Aids do you make use of during your teaching?

(b) Are they made

- (i) by you? or
- (ii) by your pupils under your guidance? or
- (iii) by the Craft Instructor on your suggestion? or
- (iv) as part of Club Activities (Science Club, Language Club, etc.)

III. PREPARATION OF CLASS-WORK

12.(a) Do you plan beforehand the work for the whole year or for the whole term?

(b) If not, how do you plan your work?

13. Do you prepare your teaching notes everyday or during the previous week-end?

14. Do you write teaching notes every year afresh?

15. Mention the points you stress in your teaching notes.

16. What are your views and suggestions on the preparation of teaching notes?

IV. TESTS

17.(a) To measure pupils' progress what kinds of tests (Achievement Tests, Diagnostic Tests, etc.) do you conduct?

(b) How do you use the test results to find out the degree of pupils' grasp of what you have taught and to rectify the shortcomings, if any, in your teaching?

18. How often do you give tests - weekly or monthly or at the end of each major topic or lesson taught?

19. From your teaching experience give some specific instances to show that teaching and testing should go together.

V. IN-SERVICE TRAINING

20. Give particulars regarding the Seminars, Workshops and Refresher Courses attended by you.

21. Indicate in what ways such In-Service Training has been of value to you.

VI. MISCELLANEOUS

22. Mention some of the ways by which you try to keep yourself in touch with knowledge and modern trends relating to the teaching of your subjects.

23. Do you pursue any hobbies useful to you in the teaching of your subjects? Mention them.

24. (a) Give the important suggestions regarding the teaching of your subjects offered by

   (i) Inspecting Officers;
   (ii) the Head of your Institution; and
   (iii) any of your colleagues.

   (b) State the extent to which you have found them practicable.

25. Give your suggestions

   (a) to improve the attainment of pupils;
   (b) to improve the standards of teaching;
   (c) to ensure co-ordination of efforts on the part of the staff, and
   (d) to raise the tone of the school.

VII. ADDITIONAL DETAILS TO BE FURNISHED BY TEACHERS OF SCIENCE.

26. With the available material in your school laboratory, are you demonstrating experiments in your classes?

27. Are you encouraging individual practical work to be done by the pupils in the laboratory on the basis of the syllabus?

QUESTIONNAIRE

(FOR HEADS OF HIGH SCHOOLS ONLY)

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I. ALLOTMENT OF FUNDS

Details of expenditure for year:	1960-61	1961-62
Reference books		
General books		
Books & journals on Methods of Teaching.		
APPARATUSES FOR		
Science		
Mathematics		
Social studies		
AUDIO-VISUAL AIDS		
Radio or other equipment		
Films & Filmstrips		

II. ESSENTIAL EQUIPMENT AVAILABLE FOR THE TEACHING OF THE FOLLOWING SUBJECTS MAY BE MENTIONED

1. English
2. Mathematics
3. Science
4. Social Studies.

III. METHODS AND TECHNIQUES OF TEACHING

1. How many of your assistants adopt new methods and techniques for the teaching of their subjects? A brief description of some of these new methods and techniques may be given.

2. To what extent do these methods and techniques contribute to better progress and attainment of pupils?

Concrete instances may be given.

3. Please state your views regarding the adoption of new methods and techniques in the teaching of different subjects.

4. Mention the seminars, courses, workshops and model lessons by experts in which your assistants have participated.

5. Does the 'Departmental System' obtain in your school for purposes of co-ordination?

6. Are model lessons by gifted teachers arranged for the benefit of others?

7.(a) Do you hold staff meetings for discussion with regard to the teaching of different subjects?

(b) If so, how many such meetings are usually held in a year?

(c) A few problems discussed at such meetings may be mentioned.

8.(a) Has the school conducted any experimental project or has the school applied for financial assistance for conducting any experimental project?

(b) If so, please state the title and scope of the project.

IV. PROGRAMME OF ACTIVITIES

1. Mention the different kinds of co-curricular (extra-curricular) activities in which your pupils participate.

2. How much time is devoted per week for these activities?

3. Kindly express your views regarding their effect on pupils'' study and progress.

V. TESTS AND EXAMINATIONS

1. In addition to the terminal examinations, how many class tests are usually conducted by your assistants in their subjects during the school-year?

2. What remedial measures are attempted under your guidance after the valuation of test papers and examination papers?

3. Are parents and guardians informed of pupils' progress? Please indicate the procedure followed in this regard.

4. What are the general principles followed in regard to promotion of pupils at the end of the year?

5. Do you take into account the marks obtained by pupils in class tests?

6. The particulars under the different heads may kindly be given in the following tabular columns for the school year 1961-62:-

Standard	Total strength	No. of pupils who appeared for the Public Exam in March 1962	No. of pupils promoted or declared eligible
VIII		-	
IX		-	
X			

VI. SUPERVISION BY THE HEAD OF THE INSTITUTION.

1. How often do you supervise the work of your assistants?

2. Is the supervision entrusted to other senior assistants?

3. Mention the merits or demerits noted with regard to the teaching of English, Mathematics, Science and Social Studies.

4. In what ways do you guide your assistants in the preparation of their lesson notes and in their teaching?

~~5~~ A few actual instances may be given.

5. How are untrained teachers, if any, guided by you and your senior assistants?

6. Are cumulative records maintained? If so, the form used may kindly be sent.

7. The names of your assistants included in Case Studies in connection with our Research Project are given in the accompanying letter. They may be assessed in the three-point scale E, G and A taking into consideration their teaching ability, resourcefulness and creation of interest. (E = Excellent; G = good; A = average)

VII. MISCELLANEOUS

1. Is a Parent-Teachers Association functioning? If so, how does it contribute to the benefit of pupils?

   (One or two instances from actual experience may be given)

2. In what ways do you secure the co-operation of parents to promote the welfare of your school?

3. Please give your suggestions

   (a) to improve the attainments of pupils;

   (b) to improve the standard of teaching;

   (c) to ensure co-ordination of work among teachers of different subjects;

   (d) to secure good results in the Public Examination;

and (e) to improve the tone and discipline of the school.

VIII

Any other particulars, not covered by the questionnaire, which you consider to be important in connection with the Research Project, may also be given.

APPENDIX - V

QUESTIONS FOR INTERVIEW

ENGLISH

1. Are pupils trained to read with correct pronunciation and proper intonation?
2. Do pupils record meanings by referring to the dictionary?
3. Are books issued to pupils periodically from the library?
4. Are Direct Method and Structure Method given due importance?
5. Do pupils read English non-detailed text-books at home? What is the method followed for teaching English non-detailed text-books?
6. Is group method followed for the writing of English composition?
7. Is formal grammar taught? If so, how much time is allotted every week?
8. What kinds of tests are held in English and how often?
9. Does the teacher put oral questions? Is the response of pupils satisfactory?
10. Do teachers of English meet every month or fortnight and discuss about the methods of teaching and pupils' achievements?
11. Is any special classroom experiment tried by the teachers?
12. Are 'Model Lessons' given by experienced or gifted teachers? If so, how many in a year?

What are the types of mistakes generally committed by pupils in constructing sentences and in their English composition work?

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QUESTIONS FOR INTERVIEW

MATHEMATICS

1. How are Diagnostic tests conducted? What remedial measures are taken on the basis of pupils' answers?

2. Are 'A Type' questions given to test pupils' grasp of the fundamental principles in each topic e.g., Percentages, Compound Interest?

3. Does the teacher test pupils' spped in answering by giving about 20 questions to be answered in half an hour?

4. In what ways are pupils made to take keen interest in the learning of Mathematics?

5. Does the teacher give 'Mental sums'? How often does he give them?

6. Does the teacher give Home Work to the pupils? If so, what is the plan adopted by him?

7. How does he allot time for teaching Practical Geometry or Graph?

8. What major topics are found difficult for the grasp of pupils?

9. How often are written tests held? What is the follow-up work afterwards?

10. Is there a Mathematics Club and how is it functioning?

11. Do Mathematics teachers meet at least once a month and discuss about their classroom difficulties and teaching experiences?

12. Are 'Model Lessons' given by experienced teachers?

Mistakes generally committed by pupils:

1. Do pupils fail to work sums correctly due to their lack of ability to do the four operations in Fractions and Decimals? Give instances.

ii. Do they fail to work problems due to their wrong understanding of the principles and terms which apply to the following topics:-

H.C.F; L.C.M; Unitary method; Average; Interest;

Profit and Loss; Ratio and Proportion; Stocks

and Shares; Insurance; Cylinder; Cone; Prism.

QUESTIONS FOR INTERVIEW

SCIENCE

STATISTICS.

1. Science Laboratory:

    (a) No laboratory.
    (b) Inadequate laboratory.
    (c) Adequate laboratory.

2. (a) Demonstrations & Laboratory work.
    (b) Demonstrations only.
    (c) No Demonstrations.

3. Library:

    (a) Unclassified general library;
    (b) General Library with classified Science Section.
    (c) Separate Science Library;
    (d) No library.

4. Bulletin Boards:

    (a) General Bulletin Board including Science.
    (b) Separate Science Bulletin Board.
    (c) No Bulletin Board.

5. Science Club:

    (a) Science Club with intensified activity;
    (b) Science Club with normal activity.
    (c) No Science Club:

6. Teacher Technique:

    (a) Text-book dominated;
    (b) Teacher notes dominated;
    (c) Students' question and answer record.

7. Excursions:

    (a) Excursions to general places;
    (b) Excursions to places of specific Scientific interest.
    (c) No major excursions.

8. Practical work:

    (a) Standards involved.
    (b) No. of experiments per year.

9. Activities:

    (a) Museum;
    (b) Aquarium;
    (c) Garden.

QUESTIONS FOR INTERVIEW

SCIENCE

10. Film shows:

    (a) General Film shows.
    (b) Special Science Film shows.
    (c) No film shows.

11. Aids used:

    (a) Printed charts.
    (b) Indigenous charts.
    (c) Slides;
    (d) Filmstrips;
    (e) Films;

12. Hobby Clubs:

    (a) Presence of Clubs - Mention kind of activity;
    (b) No Clubs.

13. Educational Broadcasts:

    (a) Formal and regular listening;
    (b) Informal and casual listening;
    (c) No listening;

14. Important audio visual aids:

    (a) Sound Projector;
    (b) Tape Recorder;
    (c) Filmstrip projector;
    (d) Radio;
    (e) Camera.

15. Educational Exhibitions:

    (a) No. of times organised in school during the last 5 years;
    (b) No. of educational exhibitions visited by pupils during the last 5 years.
    (c) Any special exhibits of models, posters on occasions like Vanamahotsava day, Wild Life week etc.

16. Methods:

    (a) Demonstration method;
    (b) Lecture method;
    (c) Other methods.

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ADDITIONAL QUESTIONS - C SERIES

GENERAL

1 (a). Name of Teacher.
  (b). Name of school.

2. Your date of birth;

3. How many years of service have you put in as B.T. assistant?

4. State your present salary, Dearness Allowance and other allowances, if any.

ENGLISH

1. How many exercises in English Composition are given for a school-year?

2. Do you divide pupils into 3 or more groups to train them to discuss and select important ideas to be developed into paragraphs for writing essays which may be given as exercises in English Composition?

3. Are there English Picture Readers (Oxford University Series) in your school library for the use of pupils to create interest in them for reading English books with ease and pleasure?

3. Are you able to finish the lessons in English Prose and Poetry a month before the final examination for IX, X & XI standards? If so, in what ways do you give revision in the lessons taught?

MATHEMATICS

1. Have you prepared Diagnostic Tests for every major topic in Mathematics? Do you give written Diagnostic Tests periodically and improve your teaching methods on the basis of the performance of your pupils besides mere revision?

2. Have you attempted to test the speed of pupils in doing sums by giving about 20 sums which can each be answered within 3 minutes?

3. Do you train pupils to make models of cylinder, cone and prism and to discover the formulae for finding the surface, area & volume in the case of each?

MATHEMATICS (CONTINUED).

4. Do you encourage forward pupils to form themselves into a Mathematics Club to work out interesting problems and thus sharpen their intellect?

SCIENCE

1. Is every student given a chance to do experiments in the laboratory?

2. Are students trained to frame tabular forms for answering B type questions?

3. Do you make students time-conscious about A type questions?

4. Are students given model answers to your questions so as to pay attention to subject-matter, drawing of diagram, length of the answer and time limit?

5. In general do you teach students

   (a) technique of completing assignment work?

   (b) technique of answering questions in the final examinations both of old and new types?

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APPENDIX - VI

CONTENT OF THE B.T. DEGREE COURSE

Criteria to study the extent to which the trainees follow in their classroom work the techniques and methods learnt during their training have been drawn from the content of the course of study for the B.T. Degree Examination prescribed by the Madras University (1951). Hence extracts from the content of the course relevant to the Research Project are given below:-

COURSE OF STUDY

The course of study, which lasts for one academic year, includes:-

A. Theory of Education and School Organisation;

B. Educational Psychology and Sociology.

C. Methods of Teaching and Learning - General.

D. Methods of Teaching and Learning appropriate to not less than TWO and not more than THREE of the following subjects:-

(i) Indian languages;
(ii) Classical languages;
(iii) English
(iv) Mathematics;
(v) Science;
(vi) Home Science;
(vii) Social Studies;
(viii) Basic Education;
(ix) Technical subjects;
(x) Arts and Crafts;
(xi) Technical subjects (Agriculture, Commerce, Engineering etc.)

This College provides instruction in the following subjects:-

An Indian Language (Tamil); English, Mathematics; Science, Social Studies; Arts and Crafts.

E. Health Education, Citizenship Training and Physical Education.

F. Practical Training:-

(i) Teaching Practice (including Practice Lessons, Observation and School visits);

(ii) Practical working and maintenance of Audio-Visual Aids; preparation and maintenance of other apparatus;

(iii) Measurements and Diagnosis, Evaluation;

(iv) Practical aspects of Health Education, Citizenship Training and Physical Education;

(v) Arts and Crafts, Basic Crafts, Hobbies or Home Science for Women.

Note: (a) The course in General Methods (C) covers principles common to all subjects and includes an introduction to the teaching of languages and other subjects for all students.

(b) The courses in special Methods (D) will be brief courses, supplementary to the course in General Methods.

(c) Practical Training includes attendance at schools for not less than 25 days in the year. At least 15 of these will be continuous. The programme for each student will approximate to the normal daily work of a teacher.

(d) Each College will decide the Arts and Crafts, etc., to be taught under F/v and will submit a syllabus in the subject or subjects chosen to the Supervising Examiners for approval.

SCHEME OF EXAMINATION.

(a) WRITTEN EXAMINATION - The subjects and scheme of examination will be as follows:-

	Hours	Marks.
1. Principles of Education and School Organisation (A) ...	3	100
2. Educational Psychology and Sociology (B) ...	3	100
3. Methods of Teaching and Learning - General (C) ...	3	100
(In this paper each candidate will be required to answer three questions on General Methods and two questions on the introduction to the teaching of subjects other than those chosen by him under D). ...		
4. Methods of Teaching and Learning - Special (D) Optional Subjects	3	100
(In this paper each candidate will be required to answer 3 questions in each of the two subjects offered by him or 2 questions in each of the three subjects offered by him).		
5. Health Education, Citizenship Training and Physical Education ...	3	100
Total (5 papers) ...		500

(b) Practical Tests:- Marks for the various aspects of Practical Training are allotted as follows:-

1. Teaching Practice (F/i) ...		200
2. Practical working and maintenance of Audio-Visual Apparatus etc.(F/ii) ..	30	100
Measurement and Evaluation (F/iii) ..	40	
Arts and Crafts (F/v)	30	
3. Practical aspects of Health Education and Citizenship Training (F/iv) ..	50	100
Physical Education	50	
TOTAL		400

Marks for each of the various aspects of Practical Training F/i to F/v will be allotted on the following basis:-

Mark A Very good (Class I Standard)
Mark B Good (Class II Standard)
Mark C Pass Standard
Mark D Failure.

PASSING MINIMUM.

No candidate will be admitted to the B.T. Degree unless he has passed both the Practical Test and the Written Examination.

A candidate will be declared to have passed the written examination if he obtains (i) not less than 35 per cent in each of the five papers and (ii) not less than 40 per cent in the five papers taken together. All other candidates will be deemed to have failed in the examination.

A candidate will be declared to have passed the practical test if he obtains not less than (C) in each aspect of teaching practice F/i to F/v provided that a candidate who fails in one aspect only of F/ii to F/v will be declared to have passed if he obtained not less than Mark B in section F/i.

CLASSIFICATION OF SUCCESSFUL CANDIDATES.

Successful candidates will be classified separately for

(a) the Written Examination and (b) the Practical Test. In the case of written examination successful candidates who obtain not less than 60 per cent of the total marks will be placed in the first class, and those who obtain not less than 50 per cent of the total marks will be placed in the second class. The remaining successful candidates will be placed in the third class.

In the case of practical tests, successful candidates who obtain not less than mark A in section F/i and not less than mark B in Sections F/ii to F/v will be placed in the I Class. Those who obtain mark A or B in section F/i and not less than mark B in any two aspects of sections F/ii to F/v and not less than mark C in the remaining aspects will be placed in the II Class. The remaining successful candidates will be placed in the III Class.

The objective rating scale for Teaching Practice as followed in the Training College is as follows:-

(The marks may be entered in brackets provided)

SUBJECT:
DATE:

A. MATTER	( )	1. Adequacy	( )
		2. Relevancy to objective	( )
		3. Logical continuity	( )
		4. Psychological Organization in Notes of Lessons	( )
		5. Relation to or illustrations from real life	( )
B. METHOD	( )	1. Creation of interest	( )
		2. Eliciting	( )
		3. Technique and clarity of presentation	( )
		4. Language	( )
		5. Use of Induction	( )
C. AIDS	( )	1. Adequacy	( )
		2. Relevancy	( )
		3. Exploitation	( )
		4. Improvisation or Resourcefulness	( )

D. PUPIL ACTIVITY ( )
1. Pupil response to questions ( )
2. Scope for Physical activity ( )
3. Writing/Reciting/Reading ( )
4. Participation in Demonstration ( )
5. Other kinds of activity ( )

E. TEACHER-TRAITS ( )
1. Preparation ( )
2. Technique of questioning ( )
3. Personality - voice, dress, confidence etc. ( )
4. Class-control ( )
5. Payment of individual attention ( )

Total ------ Final Grading

Name of School:
Name of Trainee:
Standard:
Topic:

SIGNATURE OF SUPERVISOR.

Hints for Evaluation.

There are 25 items to be evaluated. Each item may be given marks 3, 2 or 1 according as it is evaluated to be good, fair or unsatisfactory. Marks 4 or 0 may be given if adjudged excellent or poor. Fractions may be avoided.

Final Grading:

F-	Less than 40 %
C-	40 to 44 %
C+	45 to 49 %
B-	50 to 54 %
B+	55 to 59 %
A-	60 to 64 %
A+	65 to 74 %
D-	75 to 84 %
D+	85 to 99 %
H-	100 %

SYLLABUS.

As the subjects English, Mathematics and General Science are alone taken up for investigation under this Project the syllabus in each of these subjects is given hereunder:

ENGLISH

A. THE POSITION OF ENGLISH IN INDIA:- Utilitarian and cultural aims in the learning of English to-day.

The four language abilities and their relative importance for students of English.

The value for the Indian teacher of books on the teaching of English and other modern languages.

B. THE LEARNING OF A MODERN LANGUAGE:- A comparison between

the method of learning the mother tongue and the learning of a second language.

Difference in approach according to the age at which the study of a modern language is begun.

A critical evaluation of methods of teaching modern languages e.g., the Translation Method and the Direct Method.

The influence of the scientific method on the teaching of modern languages (e.g., word frequency lists).

The importance of clear objectives at each stage and for each aspect of language learning.

The primary emphasis on language rather than on literature.

C. THE BEGINNING OF ENGLISH - FORMS I AND II.

1. LISTENING AND SPEAKING: The importance of good models in pronunciation and intonation.

Practice in the pronunciation of new sounds.

The sentence, not the word, the unit of thought and instruction.

The imitation and frequent repetition of simple sentence forms; the substitution method.

A selected and graded vocabulary; graded teaching of tenses and sentence forms.

2. READING: - Different methods of teaching reading to beginners; the value of both the phonic and the sentence methods.

Individual difficulties and remedial exercises.

The use of charts and equipment in the beginning of reading.

The importance of training, from the first, in both silent and oral reading.

3. WRITING: (a) Order and method in teaching the writing of

letters and words.

Connection with phonic drill.

Independent procedure in reading and writing.

(b) Spelling and punctuation - Graded teaching with clear objectives for each stage.

(c) Early written exercises (e.g.) filling in the blanks and their connection with oral work.

Early exercises in reproduction.

D. THE TEACHING OF ENGLISH AFTER THE INITIAL STAGES - FORMS III - VI

1. THE DETAILED READER: - The importance of the ability to read intelligently for the student of English in India.

Requisites of a good reader.

Methods of explaining the meaning of words, phrases and idioms.

The extension of a working and a recognition vocabulary.

The use of the mother tongue.

Drill in the use of new words and phrases.

Types of exercises based on the reader for oral and written work.

2. EXTENSIVE READING:- The need to develop an interest in reading and the power to gather information quickly and accurately.

The choice and treatment of extensive readers, narrative and informational.

Tests of speed and comprehension in reading.

3. ORAL AND WRITTEN COMPOSITION - Correlation with reading and grammar.

Emphasis on the correction of common errors.

Different forms of composition; the use of pictures.

The value of oral preparation of written work, and of careful transition from reproduction to free composition.

Consideration of the needs of practical life e.g., business letters.

4. GRAMMAR: - Discussion as to its practical usefulness and the stage at which it should be introduced.

Functional grammar.

Comparison and contrast with the grammar of the mother tongue.

5. POETRY - The place of poetry and the stage at which it should be introduced. Contrasted methods and aims of teaching poetry and prose.

The selection of suitable poetry for different forms.

The teaching of recitation.

6. TESTS AND EXAMINATIONS - The scope and form of internal and external examinations. Standardized achievement tests in English (tests of language and thought not merely of the knowledge of facts.)

7. TRANSLATION - Its practical and linguistic uses. Stage at which it should be introduced.

8. THE ORGANIZATION OF ENGLISH TEACHING: The syllabus; assignments; notes of lessons. The school library, museum; picture collection.

The use of the radio, gramophone and the cinema in the teaching of English.

Co-operation with teachers of other subjects e.g., the teacher of the mother tongue.

PRACTICAL WORK.

Some of the following practical work should be carried out as facilities permit:-

P.T.O

1. Preparation of teaching equipment -
    (a) Flash cards and its individual apparatus;
    (b) Cut outs for use with a flannel board;
    (c) Pictures for picture composition.
2. Exercises in voice production and chorus verse speaking.
3. Phonic exercises.
4. Script writing in note books and on the black-board.
5. Preparation of individual assignment on Dalton plan lines.
6. Preparation of tests in English.

MATHEMATICS.

LECTURES:--

1. Aims of teaching Mathematics.
    Practical, Social, Disciplinary and Cultural.

2. The contents and organisation of School Mathematics.

(i) Syllabus in our schools; Modern tendencies. General Mathematics and elective courses;

(ii) Organization of the syllabus:- The logical and psychological orders of development. Correlation of the different branches of Mathematics among themselves. Correlation of the different topics of the same branch.

3. The contribution of the study of the history of Mathematics to the teaching of Mathematics. History of the important topics, e.g., number system, direct numbers, function concept parallel postulate. Contribution to the pedagogy of Mathematics by Montessori.

4. Methods of teaching Mathematics: - (i) Inductive and deductive methods; analytic and synthetic methods; heuristic method; laboratory method; project method; teaching through a craft.

(ii) Psychological considerations influencing the teaching of Mathematics - Motivation, importance of drill lessons in Mathematics, developing speed and accuracy. Problem

solving, objective aids, rationalisation.

5. Detailed consideration of the several topics in arithmetic, algebra and geometry. Functional thinking.

6. Text-books. Home work;

7. New type tests. Standardised tests; their value and limitations.

8. Elements of statistical methods - Fundamental ideas of statistical method applied to educational problems. Frequency distribution, graphic representations of data, measures of central tendency, dispersion and co-efficient of correlation.

PRACTICAL WORK

Some of the following as facilities permit:-

(a) Review of the subject matter of mathematics for the various grades in Elementary and Special Mathematics. Drawing up a scheme of work to be done in each term, month and week for various classes. Preparing assignments on particular topics.

(b) Making teaching aids (pictures, charts, diagrams, models etc.) individually or in small groups, using such materials as drawing paper, squared paper, coloured paper, cardboard and plywood.

(c) Preparation and administration of New-type Tests. Practice in diagnosing individual and group difficulties of pupils and suggesting remedial measures. Keeping records of individual pupils in speed and accuracy in working sums of a particular type.

(d) Practical work outside the class room, such as measuring heights and distances, to make the learning of geometry concrete.

(e) Preparing a paper on an assigned topic (e.g.) a topic in the history of Mathematics) and reading it before the Mathematics Association of the ~~Govt~~ College.

SCIENCE

PART I

1. Aims and values of teaching Science in schools.

2. Correlation of Science with other subjects in the curriculum.

3. Principles of planning of the Science syllabus for the Primary, Middle, and High School stages; environment, Science interests and activities.

4. Scientific method; Inductive and deductive procedures; analysis and synthesis - hypothesis, conclusion - testing the validity of Scientific Theories.

5. Methods of teaching Science - Lecture-demonstration method - heuristic method - problem method - project method - the historical and biographical approach.

6. The Science laboratory - laboratory planning and equipment. Laboratory organization and management - laboratory exercises and records - care and use of apparatus - accidents and first-aid treatment - the aquarium and terrarium.

7. Teaching aids - Science text books and libraries - excursions- science exhibitions - Science clubs and societies- museums and films.

8. Methods of testing:- Oral and written tests - essay type and new type tests - practical examinations, how conducted and valued.

PART II - PRACTICAL WORK.

Some of the following as facilities permit:-

A review of the subject matter of science, physical and natural for the various grades; the setting up of demonstration apparatus; drawing up a list of laboratory exercises for elementary science; preparing laboratory directions; use of school and home-made apparatus.

Preparation and study of plant and animal specimens;

keeping records, nature diaries and calendars; work in the school garden.

Setting of new type tests.

Photography and preparation of lantern slides.

Practice in simple wood-work and metal work and glass blowing wherever possible.

Note: The syllabus in each of the above subjects has been revised in 1962

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